NON-PUBLIC?: N
ACCESSION #: 9509290006
LICENSEE EVENT REPORT (LER)

FACILITY NAME: D.C. Cook Nuclear Plant - Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000316

TITLE: Rx Trip Caused by a Turbine Trip on High Moisture
Separator Reheater level
EVENT DATE: 8/26/95 LER #: 95-004-00 REPORT DATE: 9/25/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: G.A. Weber, Plant Engineering
Superintendent TELEPHONE: (616) 465-5901
x2511

COMPONENT FAILURE DESCRIPTION:
CAUSE: BG SYSTEM: 1B COMPONENT: LS MANUFACTURER: Magnetrol
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 0149 hours on August 26, 1995 while at 100 percent Rated Thermal Power, Unit 2 received a turbine trip/reactor trip signal from a Main Turbine Moisture Separator High Level. At the time of the trip, turbine valve testing was in progress with no abnormal alarms standing. Level alarms which normally precede the MSR High Level trip signal did not actuate. The turbine trip signal caused the reactor trip.

After the reactor trip, all safety systems operated normally in response to the trip signal. With the exception of the failure of the Nuclear Instrumentation Channel I Source Range to indicate the correct counts per second due to abnormally low indication, all post reactor trip responses were normal. The reactor was stabilized in Mode 3, Hot Standby, and repairs were performed. This event was determined to have no actual or

potential adverse effect on the health and safety of the public.

END OF ABSTRACT

Conditions Prior to Occurrence

Unit 2 in Mode 1, Power Operation, at 100 percent Rated Thermal Power

Description of Event

Unit 2 experienced a turbine trip and reactor trip from 100% power at 0149 hours on August 26, 1995 during the performance of main turbine valve testing. The turbine trip was initiated by actuation of 2-MLS-418, RIGHT MOISTURE SEPARATOR REHEATER OME-80R MOISTURE SEPARATOR LEVEL
SWITCH. Following a 5 second time delay, this switch simultaneously actuates the "W (R) MOIST SEP DRN LVL HI-HI TURBINE TRIP" annunciator (Panel 216, Drop 38) and initiates a turbine trip. No other annunciators associated with the Right MSR or Right Moisture Separator Drain Tank (MSDT) were received with this trip.

The Moisture Separator region of the Right MSR, along with several drain points from the crossunder piping, drains to the Right MSDT. The Right MSDT then drains normally to Heater 4B or alternately to Condenser "C". A similar configuration exists for the Left MSR. If flooding conditions actually exist in this system, several actions should occur prior to actuation of 2-MLS-418 as level rises in the MSDT and its inlet piping. Level alarm switch 2-MLA-414 should actuate the "W (R) MOIST SEP DRAIN TANK LEVEL HIGH" annunciator, level alarm switch 2-MLA-413 should actuate the "W (R) MOIST SEP DRAIN TANK LEVEL HI-Hi" annunciator, and level controller 2-MLC-407 should open valve 2-MRV-427 to provide an alternate drain path to Condenser "C". None of these precursor actions occurred prior to the turbine trip. The two level alarm switches and the level controller were verified to be functioning properly during post-trip investigation.

Cause of Event

It was concluded that the trip was caused by spurious actuation of 2-MLS-418.

As all three devices were found functional during the post-trip investigation, an actual level increase in the MSR drain lines is not felt to be a reasonable scenario. For an actual water level to rise to

the setpoint of 2-MLS-418, the Right MSDT would have to flood completely, which should initiate 2 annunciators and one automatic valve manipulation. The water would continue to fill long horizontal and vertical runs of 10", 12", and 16" pipe to an elevation more than 8 feet above the MSDT Hi-Hi Level alarm setpoint.

The configuration of the sensing lines for 2-MLS-418 is a likely contributor to the actuation of this level switch. These 1 " sensing lines tap into one of the 12" drain lines from the shell of the Right MSR and include more than 26 feet of horizontal piping.

Further evidence of sensing line configuration contributing to this event was discovered during the post-trip investigation. With Unit 2 in Mode 3 and no significant flow though the MSRs or MSDTs, a functional check of both Right and Left Moisture Separator Level Switches (2-MLS-418 and 2-MLS-420) was performed by isolating the sensing lines from the 12" process lines and filling the sensing lines with water to cause switch actuation and verify switch setpoints. After the switches were verified functional, the sensing line isolation valves were re-opened to restore normal system lineup. During opening of the low side isolation valve for 2-MLS-420 the associated annunciator and turbine trip for this switch were received, indicating that the float in the level switch had been lifted for more than 5 seconds with no actual level existing in the process piping.

Analysis of Event

This event is being reported per 10 CFR 50.73(a)(2)(iv), as an event that resulted in automatic actuation of Engineered Safety Features (ESF), including the Reactor Protection System (RPS).

A reactor trip occurred when the main turbine tripped above 10 percent Rated Thermal Power on Main Turbine Moisture Separator High Level. All control rods fully inserted, both Motor Driven Auxiliary Feedwater Pumps started, and a feedwater isolation occurred, all as designed.

Normal offsite power was available, the emergency diesel generators were in standby, and no safety equipment was out of service prior to the trip. This event did not have any actual or potential adverse impact on the health and safety of the public.

Corrective Actions

A Temporary Modification (TM) was installed following this trip. The TM

removed the turbine trip function from level switches 2-MLS-418 and 2-MLS-420, and preserves the alarm function (Annunciator Panel 216, Drops 28 and 38) for these switches.

The TM also included a change to the Annunciator Response Procedures for these 2 annunciators. Upon receipt of either of these annunciators, Operations is directed to manually trip the turbine if either of the associated MSDT level alarms is also standing. This ensures plant protection in the event of an actual high level in the MSR Moisture Separator drain system, while preventing spurious trips from erroneous actuation of the level switches.

The basis and continued need for this automatic turbine trip are being evaluated. Once this evaluation is complete it will be determined if a modification to the sensing lines for the Moisture Separator Level Switches and the level switch circuitry would be necessary.

Failed Component Identification

Component Name: 2-MLS-418
Manufacturer: Magnetrol International
Model: 602-SP-X

Previous Similar Events

LER 316/94-008-00

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
616 465 5901

AEP
INDIANA
MICHIGAN
POWER

September 25, 1995

United States Nuclear Regulatory Commission

Document Control Desk
Rockville, Maryland 20852

Operating Licenses DPR-74
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

95-004-00

Sincerely,

A. A. Blind
Plant Manager

/clc

Attachment

c: H. J. Miller, Region III
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